TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
WILLIAM R. SNODGRASS TENNESSEE TOWER, 15TH FLOOR
312 ROSA L. PARKS AVENUE
NASHVILLE, TENNESSEE 37243

MEMORANDUM
Date: May 23, 2017
Name: JMPr

I. Facility Visited (Name, address, phone number and Facility number)

Masonite Corporation
One Premdor Drive
Dickson, Tennessee 37055
Facility ID: 22-0079

II. Date of Visit

May 23, 2017

III. TN APC Participants

Jill Pratt (Central Office)
Chelsea Meadows (Central Office)

IV. Facility Participants

Rick Smith, Regional EHS Manager
RSmith@masonite.com
c: 620-232-4740
o: 620-231-8200 ext. 4643

Autumn Clark, Facility EHS Manager
AClark@masonite.com

V. Purpose of Visit

The purpose of the facility visit was to become familiar with the composite metal door manufacturing process, verify that all sources accounted for in the current permits reflect what was presented in the applications and what is located at the facility, and determine if there are additional sources located at the facility that should be permitted.

VI. Description of Operations

The Masonite Corporation manufacturers composite metal doors for resale at participating retailers. This facility currently has three (3) active operating permits, Permit #061174P for the woodworking and composite door machining, Permit #060880P for the surface coating operation, and Permit #060604P for the PVC welding operation. True Minor Operating Permits #072349, #072350, and #072351 are pending for this facility. The facility has requested that all active sources be combined into a single permit.

VII. Plant Tour

This facility consists of three (3) active sources (Sources #06, #11, and #12) used to manufacture composite metal doors. Each source operates independent of one another and currently consists of the following operations (as noted on the active permits as of the date of this report):

- **Source 06:** Woodworking and Composite Door Manufacturing
- **Source 11:** Surface Coating of Door Edges
- **Source 12:** PVC Welding

The woodworking and composite door manufacturing operation consisted of two (2) lines: the automated line and the manual line. Each line operated independently of one another, but consisted of the same general process. (NOTE: Some variation regarding when or how a process occurred were observed between the two production lines. The description below is a general overview of the manufacturing process.)

Each line begins with the door assembly, which consisted of the interior door frame (wood and/or vinyl), the top and bottom fiberglass sheet skins, and the door mold. Hot melt glue is applied to the wood components of the door frames via rollers during the assembly process. The hot melt glue adheres the wood stiles and rails to the fiberglass sheet skins. It should be noted that a composite wood rail is applied to the bottom of the door to prevent rotting. The assembled doors are then conveyed to the lay-up presses where bonding between the frame and fiberglass sheet skins occurs.

From the lay-up presses, the doors are conveyed to the foam injecting. Polyurethane foam is injected into holes previously drilled in the bottom composite wood rail of the door. The foam expands and hardens to create the core of the door. The doors are then conveyed to the sizing machines. Each sizing machine consists of two (2) sets of saws. The first set of saws trims both sides of the doors, and the second set of saws trims the top and bottom of the door. Approximately 1/8-inch of foam and wood is trimmed from all sides of the door. Light sanding of the trimmed door edges and an inspection occurs prior to transferring the doors to the surface coating operation.

The surface coating operation consists of a spray booth, an infrared heater, and a buffer. A light, water-based primer is applied manually via a spray gun to all four edges of the doors. Multiple doors are stacked during the surface coating operation for production efficiency and to maximize the paint usage. The freshly coated stack of doors is conveyed through the infrared heater where drying of the paint occurs. From the dryer, the stack of doors is conveyed to the buffer where smooth edges are achieved by removing excess dried paint.

A portion of the finished doors are transported to the cleaning and inspection area of the facility, while the remainder of the doors is transported to the “cut-out” area. In the cut-out area, portions of the door are mechanically removed in order to add windows or decorative inserts. Once cut, those doors are transported to the cleaning and inspection area. In the cleaning and inspection area, the

windows or decorative inserts are installed in those doors with cut-outs. All the doors undergo cleaning and a thorough inspection to ensure there are no deformities. Finished doors are then packaged and stored for shipping to the designated retail customers.

In addition to the door manufacturing and surface coating operations, a vinyl PVC welding operation is located at this facility. The welding operation consists of an automatic machine used heat and weld the rails and stiles together to form the vinyl PVC door frames. This source is not subject to NESHAP Subpart XXXXXX—National Emission Standards for Hazardous Air Pollutants Area Source Standards for Nine Metal Fabrication and Finishing Source Categories. During the facility tour, Mr. Smith and Ms. Clark noted that the PVC welding operation is rarely in use and is scheduled to be removed from operation sometime in 2018.

Pollutants from this operation consist primarily of particulate matter (PM). The PM emissions are generated from the trimming and sanding operations at both the manual and automatic production lines. Suction is used to transfer the particulate matter at the point of trimming and sanding to the dust collectors located on the exterior of the building. Material in the dust collectors is discharged into roll-off dumpsters, which are completely enclosed and equipped with openings in the top of the dumpster for tight fitting chutes to discharge the waste. During the site visit, no visible emissions were observed from either dust collector or from loading of the roll-off dumpster.

Other PM emissions were generated from the cut-out area and the buffing of the finished door edges. Both of these operations are located near the center of the building's enclosure (away from doors and/or windows) and fugitive in nature (no control device). In addition, the PM emissions from these operations were observed to be negligible.

Other pollutants from this operation consists of volatile organic compounds (VOCs). The VOC emissions are generated from the adhesives used to construct the door frames and from the paints used to coat the edges of the doors. The rollers applying the adhesives are located away from all doors and/or windows and had a nearly 100% transfer efficiency. The surface coating operation is located in a completely enclosed "booth" near the center of the building's enclosure (away from doors and/or windows). No control device is used for any VOC emitting operations; therefore, all emissions are fugitive.

VIII. Conclusions and Summary

Based on the facility observations, it is determined that adjustments to the current permits are necessary. Changes in the adhesives used to construct the door frames and the paint used in the surface coating operation has occurred since the last permit was issued. The adhesives currently used are low-VOC and are transferred to the substrate via rollers, providing nearly 100% transfer efficiency. In addition, the paints used in the surface coating are water-based and have low-VOC content. Mr. Smith provided the Division with updated SDS for all adhesives and paints used at the facility prior to the site visit. Should the facility agree, the allowable VOC emission limit for both production lines and the surface coating operation could be lowered.